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Freezing-in of molecular mobility of small molecules (probes) in glassy polymers and secondary relaxation transitions

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Abstract

The behavior of probe molecules of different sizes (1,2-bromofluoroethane, 1,2-dichloroethane, dichloromethoxyphosphine oxide, 1,2-di-p-bromophenylethane) in PMMA and PVAC was considered. There is a linear correlation between the freezing temperature of conformational transitions of probe molecules and the size of the rotating groups of the probe. Processes that lead to the freezing-in of conformational equilibria of probes in polymers with a decrease in temperature are discussed on the basis of these results. The free-volume distribution and the nature of secondary relaxation processes in glassy polyvinyltrimethylsilane and polytrimethylsilylpropyne were studied by means of the conformation-probe technique. © Nauka/Interperiodica 2007.

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